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ABSTRACT

Effects of maternal-neonatal extended contact or separation were examined in 76 children (8 to 10 years old), five of whom were receiving special education services, and 28 who had been retained in their grade. Of the five Ss requiring special services, three were classified as slow learners and two as speech impaired, two conditions linked by previous research to deprived maternal-neonatal contact. Deprived contact was also a prediction of grade retention. In total, 50% of Ss born at a hospital enforcing mother-baby separation totaling several days required specific educational intervention. Incidence was even higher (65%) for males born at that hospital. (CL)

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Contrasting Mother-Infant Contact: Educational Consequences a Decade Later

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During the past four decades the process of bonding by which the human infant becomes attached to his mother has been rigorously investigated and delineated. The term "attachment" is associated with Bowlby's integration of psychoanalytic theory and ethological concepts. His hypothesis (1958, 1969) suggested that a number of component instinctual responses, which mature at different times during the first year of life and develop at different rates, serve to bind child to mother and contribute secondarily to the reciprocal dynamic of binding mother to child.

Like Bowlby, most other researchers consider bonding an interactional relationship in which reciprocity is central. Spitz (1965) reported differing contributions to the relationship made by mother and infant: "While the mother provides what the baby needs, in his turn (and this is less generally acknowledged) the baby provides what the mother needs" (p. 96). Spitz's work (1954, 1965), too, is based on Freud's seminal ideas of reciprocal mother-child relations.

But while psychoanalytic theory contributed significantly to the recognition of the importance of early experience, it generally considered the influence primarily emotional. Unsatisfactory emotional experience prevented free intellectual development, while adequate mothering provided the security in which innate capacity could reach its full potential.

Only in the 70s did research begin to focus on the development of bonding from mother-to-infant and on consequences other than emotional. There were two major precursors to this new concentration of interest: 1) In many areas of behavioral science, it has been profitable to study the behavior of mothers in a range of infra-human species. Detailed observation of animal mothers and their offspring

demonstrated--in the case of cows, goats, and sheep--distinctly aberrant mothering behavior when mother and offspring were separated immediately after birth for as brief a period as one to four hours. Reunion following separation on the fifth day, in contrast, resulted in normal mothering and protective behavior. 2) A second precursor was the observation made some 15 years ago by staff of intensive-care nurseries that battering and failure-to-thrive appear disproportionately in premature infants and in children hospitalized for other reasons during the neonatal period.

Experience with infra-human species and mothering disturbances associated with hospitalized infants suggested that even a temporary separation in the period following delivery may have a harmful, long-range effect on later mothering, even of full-term infants. Klaus and Kennell tested their hypothesis of a maternal-sensitive period. They placed 28 primiparous women with similar backgrounds in two study groups shortly after delivery of normal full-term infants. The control group of 14 mothers had the usual physical contact with their babies, while the extended-contact mothers had 16 hours' additional exposure (one hour within the first three hours after birth and five hours each afternoon). Using a standardized interview, an examination of the baby, and a time-lapse film, Klaus and Kennell found that, at one month (1970, 1972) and later at one year following birth (Kennell et al., 1974), extended-contact mothers were more reluctant to leave their infants with substitute caretakers, and displayed more soothing behavior, eye contact, and fondling. Two years later, extended-contact mothers used significantly more questions, adjectives, words per proposition, and fewer commands (Ringler et al., 1975). In addition to more productive feedback language and teaching behavior, the mothers displayed more sensitivity and attending behaviors. After five years,

significantly higher IQs and more advanced receptive and expressive language scores--on the part of the children--were demonstrated (Ringler et al., 1976).

Other studies, too, reported increased fondling and caressing on the part of extended-contact mothers. In research with a different focus, Brazelton (1966) demonstrated that the visual apparatus is well-developed at birth and that the neonate's ability to fixate and follow coincides with his mother's intense interest in his eyes. Using the technique of kinesics, in which human communication is microanalyzed, Condon and Sander (1974) demonstrated a subtle communication process in which infant movement is synchronized with articulatory segments of adult speech. They suggested that this communication process may prepare the operational format for later speech. The apparent conclusion of varied research is that bonding may be disturbed by early deprivation of visual, auditory, olfactory, and tactile contact.

It may be instructive to shift gears to consider briefly a 100-year review of the mother's role in the hospital nursery. While most births of the 1880s were at home, standard hospital procedure at the time involved rooming-in (though the term was not used until 1943, by Gesell and Ilg). The arrangement was dropped during the 1890s and early 1900s in an attempt to protect the newborn from epidemic diarrhea and respiratory infection; visiting was prohibited and handling curtailed. In his 1907 book, The Nursling, Budin warned that mothers should have close contact even with their premature infants: "Not only will the weakling be saved, but a . . . mother will also have been conserved" (p. 13). But despite his prophetic warning, pediatric texts as late as 1960 recommended minimal handling, strict isolation, and exclusion of visitors from the nursery. Unnoted by the authors was a renewed interest in rooming-in by Jackson (1948) at Yale, fol-

lowed by much support. There was no evidence of increased hazard of infections; rooming-in was recommended to strengthen bonding, to foster adaptation, and to enhance maternal confidence. Nevertheless, separation is still the order of the day. Traditional current practice involves a glimpse of the baby shortly after birth, brief contact at six to 12 hours, and then visits of 20 to 30 minutes every four hours for feeding.

Keenly aware of attachment research and of traditional current nursery practice, it came to my attention that dramatically differing care procedures at two Louisiana institutions provide naturally contrasting situations: The maternity ward at the Washington-St. Tammary Charity Hospital (WSTCH) in Bogalusa offers extended-contact via compulsory rooming-in, with the infant in a bassinet on the side of his mother's bed from the time of birth until discharge from the hospital. Birth at Charity Hospital of Louisiana in New Orleans (CHNO), in contrast, results in a contact-deprived condition of several days' total separation of mother and infant; from birth until discharge, the newborn is kept exclusively in a nursery on a wing opposite that of the maternity ward. Admittedly, the comparability of the hospitals on many variables (size, rural-urban, etc.) can be questioned. However, current hospital practice in the United States, typically involving periodic contact, makes it more remarkable that two settings were available with such extraordinary conditions (especially absolute separation).

Intrigued by the rare opportunity to compare "extreme groups" on postpartum contact, I decided to investigate the relative contribution of maternal-neonatal contact condition, child's sex, and mother's age and education to the child's subsequent placement in special education services or retention in grade in the regular classroom. Previous studies attempting to identify children at-risk for a develop-

mental or learning problem (e.g., Ramey et al., 1978) have not considered maternal-neonatal contact condition. In Klaus and Kennell's research (1976) on consequences of contrasting early contact, sequelae were reported on children only to age five years and not to 10 years of age, as in the current study.

In order to answer the research questions, I compared a group of children born at CHNO which serves patients from any parish (county) in the state, with a group of children delivered at the Bogalusa hospital, at which non-paid care is restricted to clients from Washington and St. Tammany Parishes. Because St. Tammany Parish is situated roughly equidistant from the two hospitals, a comparable number of St. Tammany babies fulfilling other selection criteria are born at the two hospitals. An advantage of confining the sample to children whose mothers' residence at birth was St. Tammany Parish was the additional control of contaminating factors which the restricted sample afforded. It effectively diminished consideration of rural-urban influence and obviated concern over potentially inconsistent pupil-appraisal practices and possible inequality of educational opportunity afforded by different parish public school systems.

Since most children in need of special education services are identified by the fourth grade, subjects selected for inclusion were those born at the two hospitals during 1969 and 1970. Other rigid selection criteria were imposed in order to maximize subject comparability and to eliminate children considered high-risk for developmental and learning problems. Study subjects were first-born, singleton, black, full-term, without birth injuries, without congenital malformations and anomalies, and born vaginally to charity-eligible women between 16 and 30 years of age.

Data collection proceeded as follows: I screened all 1969 and

1970 births at the Vital Records Registry of the State Department of Health and Human Resources, by checking birth certificates to determine if status parameters were consistent with prescribed selection criteria. I then reviewed birth records at the two hospitals to exclude children born by Caesarean section and those otherwise identified as high-risk at birth.

Next I searched census records at St. Tammany Schools for the names of children who met criteria for inclusion. Verification of medical data against educational census information resulted in a total of 76 children comprising the study sample. The age of the subjects at the time of data collection ranged from 8 years, 11 months to 10 years, 10 months, with a mean age of 9 years, 11 months. Maternal age recorded on birth certificates ranged from 16 through 30 years, with a mean age of 19 years, 3 months. Maternal education ranged from seventh grade to three years of college, with a mean of 10.9 grades completed.

I checked the names of the 76 children against special education records, to determine which children were receiving special services and the type of exceptionality agreed upon by the pupil appraisal team (required in Louisiana for placement in special education services). School census records revealed the grade level of children not in special education; I noted those children who had repeated one or more grades in the regular classroom.

In analyzing the data, independent or predictor variables included maternal-neonatal contact condition, child's sex, and mother's age and education. I added a fifth variable, year of birth, to verify that the inclusion of both cohorts in the analysis did not distort results. Dependent or criterion variables consisted of membership in either of two mutually exclusive categories: The subject had been placed in special education or he had not, and he had--or had not--been retained in grade

in the regular classroom.

Since there were multiple and nominally scaled groups constituting the dependent variables and since several predictors were examined simultaneously, discriminant analysis was employed to analyze the data. Only maternal-neonatal contact condition and child's sex differed significantly, according to placement in special education; these two variables provided most predictive power. All five children receiving special services were male and were born at CHNO; three were classified as slow learners and two as speech impaired.

Of the 28 children retained in grade, twice as many (19) were female; 64% ($n=18$) were born at CHNO and 36% ($n=10$) at WSTCH. Three children, of whom two were boys, had been retained two years in grade; all three children retained two years in grade were born at CHNO. According to retention status, differences were reported in maternal age and education; these variables provided most predictive power. On the average, mothers of repeaters were almost one year younger ($\bar{X}=18.67$) and had almost one year less education ($\bar{X}=10.32$) than mothers of non-retained children.

A brief discussion of the findings... That child's sex is a significant predictor of the need for special education services has also been reported by other researchers. You will recall that three of the five children in special education were classified as slow learners and two as speech impaired. That these particular handicapping conditions are likely sequelae of deprived maternal-neonatal contact was predicted by the research of Klaus and Kennell and their associates (Ringler et al., 1975) and by that of Condon and Sander (1974). Therefore, current findings corroborate those of the seminal researchers in the area of mother-infant bonding. They also extend the findings of those who predicted need for special education from birth certificate

information (Ramey et al., 1978), by the addition of mother-infant contact condition as a potent predictor of subsequent educational status.

As to retention in grade, you will recall that repeaters were most likely to be female and born at CHNO to younger mothers with less education. Ramey and his colleagues at the University of North Carolina found race and mother's educational level most predictive--and mother's age significant but less predictive--of first grade psychological and educational status; specifically, in their research, the child performed poorly if black and born to a younger mother with a tenth grade or less educational level. Considering the fact that all subjects in the present study are black, current findings are striking in their similarity to those of Ramey and his associates. Once again, contact condition made a contribution--though limited, this time--to prediction. You will recall that of the 28 children retained one year in grade, 64% were born at CHNO, along with 100% of those retained two years in the regular classroom. That children deprived of early maternal contact are subsequently at educational risk appears once again to confirm the conclusions of the pioneer researchers in the field of mother-infant bonding.

When sample children in special education placement and those retained in grade in their regular classroom are considered together (see Table 1), it becomes apparent that 50% of the children born at CHNO have required specific education intervention, be it special ed services ($n=5$) or repetition of one grade ($n=15$) or two grades ($n=3$). In contrast, no WSTCH children are in special placement, 33.3% ($n=10$) have been retained one year, and no children have been retained two years.

The statistics are even more dramatic in the case of males in

the sample (see Table 2). Of 20 males born at CHNO, 65% ($n=13$) have required specific educational intervention--and additional taxpayer support: placement in special education ($n=5$), repetition of one grade ($n=6$), and repetition of two grades ($n=2$). In contrast, only 10% ($n=1$) of the 10 males born at WSTCH has had specific educational intervention: None is in special education placement, none has repeated two grades, and only one has been retained one year in his regular classroom setting.

The acknowledged reciprocal interaction between infant characteristics and environmental factors precludes identification of any variable as "causing" a subsequent condition. Nevertheless, this research has demonstrated the degree to which selected variables contribute to later educational functioning--specifically, in the case of deprived postpartum contact, to the increased incidence of retention in grade, speech impairment, and slow learner/educational handicap status.

Educational Consequences of Contrasting Maternal-Neonatal Contact

Table 1

Subjects Requiring Specific Educational Intervention
by Hospital
(N=76)

		% Requiring Intervention	# in Special Education	# Retained One Year	# Retained Two Years	Total # in Sp Ed & Retained
Hospital	CHNO	50.0	5	15	3	23
	WSTCH	33.3	0	10	0	10

Table 2

Males Requiring Specific Educational Intervention
by Hospital
(N=30)

		% Requiring Intervention	# in Special Education	# Retained One Year	# Retained Two Years	Total # in Sp Ed & Retained
Hospital	CHNO	65.0	5	6	2	13
	WSTCH	10.0	0	1	0	1

Educational Consequences of Contrasting Maternal-Neonatal Contact

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